

SEQUENCE LISTING

<110> Estell, David A.

<120> Proteases From Gram-Positive Organisms

<130> GC381-US

<140> US 09/462,846

<141> 2000-01-13

<150> PCT/US98/19529

<151> 1998-07-14

<150> EP 97305227.7

<151> 1997-07-15

<160> 7

<170> FastSEQ for Windows Version 3.0

<210> 1

<211> 945

<212> DNA

<213> Bacillus subtilis

<400> 1

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| gcttttagctg | attttggcta | taccattccg | tcacaacgaa | caggggagtg | ctgggctttt | 120 |
| gccgcgcac | aaaatgggtca | aagcgttggt | caaaacggaa | tgtataaggg | gttcacgctc | 180 |
| agcgaattat | gggaacatca | cagacattta | ttcggacagc | ttgaagggga | ccgtttccct | 240 |
| ctgcttacia | aaatattaga | tgctgaccag | gacttatctg | ttcaggtgca | tccgaatgat | 300 |
| gaatatgcca | acatacatga | aaacgggtgag | cttggaaaaa | cagaatgctg | gtacattatt | 360 |
| gattgcca | aaaagatgccga | gattatttat | ggccacaatg | caacaacaaa | ggaagaacta | 420 |
| actaccatga | tagagcgtgg | agaatgggat | gagctcttgc | gccgtgtaaa | ggtaaagccg | 480 |
| gggggattttt | tctatgtgcc | aagcgggtact | gttcatgcga | ttggaaaagg | aattcttgct | 540 |
| ttggagacgc | agcagaactc | agacacaacc | tacagattat | atgattatga | ccgaaaagat | 600 |
| gcagaaggca | agctgcgcga | gcttcatctg | aaaaagagca | ttgaagtgat | agagggtccc | 660 |
| tctattccag | aacggcatac | agttcaccat | gaacaaattg | aggatttgct | tacaacgaca | 720 |
| ttgattgaat | gcgcttactt | ttcgggtggg | aaatggaact | tatcaggatc | agcaagctta | 780 |
| aagcagcaaa | aaccattcct | tcttatcagt | gtgattgaag | gggagggccg | tatgatctct | 840 |
| ggtgagtatg | tctatccttt | caaaaaagga | gatcatatgt | tgctgcctta | cggtcttgga | 900 |
| gaatttaa | ac | tcgaaggata | tgcagaatgt | atcgtctccc | atctg | 945 |

<210> 2

<211> 315

<212> PRT

<213> Bacillus subtilis

<400> 2

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| Met | Thr | Thr | Glu | Pro | Leu | Phe | Phe | Lys | Pro | Val | Phe | Lys | Glu | Arg | Ile |
| 1 | | | | 5 | | | | 10 | | | | | 15 | | |
| Trp | Gly | Gly | Thr | Ala | Leu | Ala | Asp | Phe | Gly | Tyr | Thr | Ile | Pro | Ser | Gln |
| | | | 20 | | | | 25 | | | | | 30 | | | |
| Arg | Thr | Gly | Glu | Cys | Trp | Ala | Phe | Ala | Ala | His | Gln | Asn | Gly | Gln | Ser |
| | 35 | | | | | | 40 | | | | | 45 | | | |

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Val | Val | Gln | Asn | Gly | Met | Tyr | Lys | Gly | Phe | Thr | Leu | Ser | Glu | Leu | Trp |
| 50 | | | | | | 55 | | | | | 60 | | | | |
| Glu | His | His | Arg | His | Leu | Phe | Gly | Gln | Leu | Glu | Gly | Asp | Arg | Phe | Pro |
| 65 | | | | | 70 | | | | | 75 | | | | | 80 |
| Leu | Leu | Thr | Lys | Ile | Leu | Asp | Ala | Asp | Gln | Asp | Leu | Ser | Val | Gln | Val |
| | | | | 85 | | | | | 90 | | | | | 95 | |
| His | Pro | Asn | Asp | Glu | Tyr | Ala | Asn | Ile | His | Glu | Asn | Gly | Glu | Leu | Gly |
| | | | | 100 | | | | 105 | | | | | 110 | | |
| Lys | Thr | Glu | Cys | Trp | Tyr | Ile | Ile | Asp | Cys | Gln | Lys | Asp | Ala | Glu | Ile |
| | | 115 | | | | | 120 | | | | | 125 | | | |
| Ile | Tyr | Gly | His | Asn | Ala | Thr | Thr | Lys | Glu | Glu | Leu | Thr | Thr | Met | Ile |
| | 130 | | | | | 135 | | | | | 140 | | | | |
| Glu | Arg | Gly | Glu | Trp | Asp | Glu | Leu | Leu | Arg | Arg | Val | Lys | Val | Lys | Pro |
| 145 | | | | | 150 | | | | | 155 | | | | | 160 |
| Gly | Asp | Phe | Phe | Tyr | Val | Pro | Ser | Gly | Thr | Val | His | Ala | Ile | Gly | Lys |
| | | | | 165 | | | | | 170 | | | | | 175 | |
| Gly | Ile | Leu | Ala | Leu | Glu | Thr | Gln | Gln | Asn | Ser | Asp | Thr | Thr | Tyr | Arg |
| | | | 180 | | | | | 185 | | | | | 190 | | |
| Leu | Tyr | Asp | Tyr | Asp | Arg | Lys | Asp | Ala | Glu | Gly | Lys | Leu | Arg | Glu | Leu |
| | 195 | | | | | 200 | | | | | | 205 | | | |
| His | Leu | Lys | Lys | Ser | Ile | Glu | Val | Ile | Glu | Val | Pro | Ser | Ile | Pro | Glu |
| | 210 | | | | | 215 | | | | | 220 | | | | |
| Arg | His | Thr | Val | His | His | Glu | Gln | Ile | Glu | Asp | Leu | Leu | Thr | Thr | Thr |
| 225 | | | | | 230 | | | | | 235 | | | | | 240 |
| Leu | Ile | Glu | Cys | Ala | Tyr | Phe | Ser | Val | Gly | Lys | Trp | Asn | Leu | Ser | Gly |
| | | | | 245 | | | | | 250 | | | | | 255 | |
| Ser | Ala | Ser | Leu | Lys | Gln | Gln | Lys | Pro | Phe | Leu | Leu | Ile | Ser | Val | Ile |
| | | | 260 | | | | | 265 | | | | | 270 | | |
| Glu | Gly | Glu | Gly | Arg | Met | Ile | Ser | Gly | Glu | Tyr | Val | Tyr | Pro | Phe | Lys |
| | 275 | | | | | 280 | | | | | | 285 | | | |
| Lys | Gly | Asp | His | Met | Leu | Leu | Pro | Tyr | Gly | Leu | Gly | Glu | Phe | Lys | Leu |
| | 290 | | | | 295 | | | | | | 300 | | | | |
| Glu | Gly | Tyr | Ala | Glu | Cys | Ile | Val | Ser | His | Leu | | | | | |
| 305 | | | | | 310 | | | | | 315 | | | | | |

<210> 3
 <211> 220
 <212> PRT
 <213> Bacillus subtilis

<400> 3

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|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Val | Leu | Asn | Asp | Gly | Asp | Val | Asn | Ile | Pro | Glu | Tyr | Val | Asp | Trp | Arg |
| 1 | | | | 5 | | | | | 10 | | | | | 15 | |
| Gln | Lys | Gly | Ala | Val | Thr | Pro | Val | Lys | Asn | Gln | Gly | Ser | Cys | Gly | Ser |
| | | | 20 | | | | | 25 | | | | | 30 | | |
| Cys | Trp | Ala | Phe | Ser | Ala | Val | Val | Thr | Ile | Glu | Gly | Ile | Ile | Lys | Ile |
| | | 35 | | | | | 40 | | | | | 45 | | | |
| Arg | Thr | Gly | Asn | Leu | Asn | Glu | Tyr | Ser | Glu | Gln | Glu | Leu | Leu | Asp | Cys |
| | 50 | | | | 55 | | | | | | 60 | | | | |
| Asp | Arg | Arg | Ser | Tyr | Gly | Cys | Asn | Gly | Gly | Tyr | Pro | Trp | Ser | Ala | Leu |
| 65 | | | | 70 | | | | | 75 | | | | | 80 | |
| Gln | Leu | Val | Ala | Gln | Tyr | Gly | Ile | His | Tyr | Arg | Asn | Thr | Tyr | Pro | Tyr |
| | | | 85 | | | | | 90 | | | | | 95 | | |
| Glu | Gly | Val | Gln | Arg | Tyr | Cys | Arg | Ser | Arg | Glu | Lys | Gly | Pro | Tyr | Ala |
| | | 100 | | | | | 105 | | | | | 110 | | | |
| Ala | Lys | Thr | Asp | Gly | Val | Arg | Gln | Val | Gln | Pro | Tyr | Asn | Glu | Gly | Ala |
| | 115 | | | | | | 120 | | | | | 125 | | | |

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Leu Leu Tyr Ser Ile Ala Asn Gln Pro Val Ser Val Val Leu Glu Ala
 130                      135                      140
Ala Gly Lys Asp Phe Gln Leu Tyr Arg Gly Gly Ile Phe Val Gly Pro
 145                      150                      155                      160
Cys Gly Asn Lys Val Asp His Ala Val Ala Ala Val Gly Tyr Gly Pro
                      165                      170                      175
Asn Tyr Ile Leu Ile Lys Asn Ser Trp Gly Thr Gly Trp Gly Glu Asn
                      180                      185                      190
Gly Tyr Ile Arg Ile Lys Arg Gly Thr Gly Asn Ser Tyr Gly Val Cys
                      195                      200                      205
Gly Leu Tyr Thr Ser Ser Phe Tyr Pro Val Lys Asn
 210                      215                      220

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<210> 4
<211> 948
<212> DNA
<213> Bacillus subtilis

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gcttttacgag atagattttgg atacagtatt ccttcagaat caacggggga atgctggggcc      120
atttccgctc atccaaaagg accgagcact gttgcaaatg gcccgataaa aggaaagaca      180
ttgatcgagc tttgggaaga gcaccgtgaa gtattcggcg gcgtagaggg ggatcggttt      240
ccgcttctga caaagctgct ggatgtgaag gaagatacgt caattaaagt tcaccctgat      300
gattactatg ccggagaaaa cgaagagggga gaactcggca agacggaatg ctggtacatt      360
atcgactgta aggaaaacgc agaaatcatt tacgggcata cggcccgcctc aaaaaccgaa      420
cttgtcacaa tgatcaacag cggtgactgg gagggcctgc tgcgaagaat caaaattaaa      480
ccgggtgatt tctattatgt gccgagcgga acgctgcacg cattgtgcaa gggggccctt      540
gttttagaga ctcagcaaaa ttcagatgcc acataccggg tgtacgatta tgaccgtctt      600
gatagcaacg gaagtccgag agagcttcat tttgccaaag cggatcaatgc cgccacgggt      660
ccccatgtgg acgggtatat agatgaatcg acagaatcaa gaaaaggaat aaccattaaa      720
acatttgtcc aagggggaata tttttcgggt tataaatggg acatcaatgg cgaagctgaa      780
atggctcagg atgaatcctt tctgatttgc agcgtgatag aagggaagcgg tttgctcaag      840
tatgaggaca aaacatgtcc gctcaaaaaa ggtgatcact ttattttgcc ggctcaaatg      900
cccgatttta cgataaaagg aacttgtacc cttatcgtgt ctcatatt      948

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<210> 5
<211> 316
<212> PRT
<213> Bacillus subtilis

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Trp Gly Gly Thr Ala Leu Arg Asp Arg Phe Gly Tyr Ser Ile Pro Ser
                      20                      25                      30
Glu Ser Thr Gly Glu Cys Trp Ala Ile Ser Ala His Pro Lys Gly Pro
                      35                      40                      45
Ser Thr Val Ala Asn Gly Pro Tyr Lys Gly Lys Thr Leu Ile Glu Leu
                      50                      55                      60
Trp Glu Glu His Arg Glu Val Phe Gly Gly Val Glu Gly Asp Arg Phe
 65                      70                      75                      80
Pro Leu Leu Thr Lys Leu Leu Asp Val Lys Glu Asp Thr Ser Ile Lys
                      85                      90                      95
Val His Pro Asp Asp Tyr Tyr Ala Gly Glu Asn Glu Glu Gly Glu Leu
                      100                     105                     110
Gly Lys Thr Glu Cys Trp Tyr Ile Ile Asp Cys Lys Glu Asn Ala Glu

```

| | | | | | | |
|-----|---------------------|---------------------|-----------------------------|-----|-----|-----|
| | 115 | | 120 | | 125 | |
| Ile | Ile Tyr Gly His Thr | Ala Arg Ser Lys Thr | Glu Leu Val Thr Met | | | |
| | 130 | | 135 | | 140 | |
| Ile | Asn Ser Gly Asp Trp | Glu Gly Leu Leu Arg | Arg Ile Lys Ile Lys | | | |
| | 145 | | 150 | | 155 | |
| Pro | Gly Asp Phe Tyr | Val Pro Ser Gly Thr | Leu His Ala Leu Cys | | | |
| | | 165 | | 170 | | 175 |
| Lys | Gly Ala Leu Val | Leu Glu Thr Gln | Asn Ser Asp Ala Thr Tyr | | | |
| | | 180 | | 185 | | 190 |
| Arg | Val Tyr Asp Tyr | Asp Arg Leu Asp | Ser Asn Gly Ser Pro Arg Glu | | | |
| | 195 | | 200 | | 205 | |
| Leu | His Phe Ala Lys | Ala Val Asn Ala | Ala Thr Val Pro His Val Asp | | | |
| | 210 | | 215 | | 220 | |
| Gly | Tyr Ile Asp Glu | Ser Thr Glu Ser | Arg Lys Gly Ile Thr Ile Lys | | | |
| | 225 | | 230 | | 235 | |
| Thr | Phe Val Gln Gly | Glu Tyr Phe Ser | Val Tyr Lys Trp Asp Ile Asn | | | |
| | | 245 | | 250 | | 255 |
| Gly | Glu Ala Glu Met | Ala Gln Asp Glu | Ser Phe Leu Ile Cys Ser Val | | | |
| | 260 | | 265 | | 270 | |
| Ile | Glu Gly Ser Gly | Leu Leu Lys Tyr | Glu Asp Lys Thr Cys Pro Leu | | | |
| | 275 | | 280 | | 285 | |
| Lys | Lys Gly Asp His | Phe Ile Leu Pro | Ala Gln Met Pro Asp Phe Thr | | | |
| | 290 | | 295 | | 300 | |
| Ile | Lys Gly Thr Cys | Thr Leu Ile Val | Ser His Ile | | | |
| | 305 | | 310 | | 315 | |

<210> 6
 <211> 945
 <212> DNA
 <213> Bacillus subtilis

<400> 6

| | | | | | | | |
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| atgacgcac | cattat | tttt | agagcctg | tttaaagaaa | gactatgggg | agggacgaag | 60 |
| cttcgtgac | cttttg | gcta | cgcaataccc | tcacaaaaaa | caggtgagtg | ctgggccggt | 120 |
| tctgcacat | g | ccatggctc | gtcgtctgta | aaaaatggcc | cgctggcagg | aaagacactt | 180 |
| gatcaagta | t | ggaaagatca | tccagagata | ttcgggtttc | cggatggtaa | ggtgtttccg | 240 |
| ctgctggtaa | a | gctgctgga | cgccaatatg | gatctctccg | tgcaagtcca | tcctgatgat | 300 |
| gattatgcaa | a | actgcacga | aaatggcgac | cttggtaaaa | cggagtgctg | gtatatcatt | 360 |
| gattgcaaa | a | gacgccga | actaat | ttttg | ggacatcatg | caagcacaaa | 420 |
| aaacaacgaa | t | agaaagcgg | tgattggaac | gggctgctga | ggcgaatcaa | aatcaagcca | 480 |
| ggagatttct | t | tttatgtgcc | aagcgggtaca | ctccatgctt | tatgtaaggg | aacccttgct | 540 |
| cttgaaatcc | a | gcaaaaactc | tgatacaaca | tatcgcgtat | acgattatga | ccgctgtaat | 600 |
| gaccagggcc | a | aaaaaagaac | tcttcatata | gaaaaagcca | tggaagtcac | aacgataccg | 660 |
| catatcgata | a | agtgcatata | accggaagta | aaagaagttg | gtaacgctga | gatcattggt | 720 |
| tatgtgcaat | a | cagattat | ttt | ctcagtgta | aaatggaaga | ttagcggccg | 780 |
| ccttcataat | c | aaacctat | ttt | gctggggagt | gttctgagcg | gatcaggacg | 840 |
| aatggtat | c | agtatgaat | g | caatgcaggc | tcacacttta | ttctgcctgc | 900 |
| gaatttacaa | a | tagaaggaac | atgtgaat | tc | atgatata | tc | 945 |

<210> 7
 <211> 315
 <212> PRT
 <213> Bacillus subtilis

<400> 7

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Met | Thr | His | Pro | Leu | Phe | Leu | Glu | Pro | Val | Phe | Lys | Glu | Arg | Leu | Trp |
| 1 | | | | 5 | | | | | 10 | | | | | 15 | |

5